

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appl. No. : 10/551,854 Confirmation No. 6166
Applicant (s) : Zenon Lysenko, et al.
Filed : September 30, 2005
TC/A.U. : 1621
Examiner : Cutliff, Yate Kai Rene
Title : ALDEHYDE AND ALCOHOL COMPOSITIONS DERIVED
FROM SEED OILS
Docket No. : 63104A
Customer No. : 00109

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

DECLARATION IIIA UNDER 37 C.F.R. §1.132

David A. Babb declares and states:

THAT, he and Zenon Lysenko, Donald L. Morrison, Donald L. Bunning, Christopher W. Derstine, James H. Gilchrist, H. Ray Jouett, Jeffrey S. Kanel, Kurt D. Olson, Wei-Jun Peng, Joe D. Phillips, Brian R. Roesch, Aaron W. Sanders, Alan K. Schrock, and Pulikkottil J. Thomas are the inventors of the subject technology of the above-captioned patent application, and that he is familiar with the Office Action dated July 23, 2008, in the above-identified application;

THAT, in 1982 he received a Bachelors of Science in Chemistry from Texas Tech University, and in 1985 he received a Ph.D. in Chemistry from Texas Tech University;

THAT, from 1985 until the current date he has worked at The Dow Chemical Company as Research Chemist (1985-1993), as Research Leader (1993-2004), and in his current position as Research Scientist (2004 – present), where he now leads a project to manufacture and evaluate polyurethanes prepared from polyols derived from seed oils;

THAT, the following remarks are made concerning the comparative experiments set forth in Declaration I (revised) and Declaration II, both filed April 30, 2008. In particular, the undersigned explains hereinbelow how certain differences in the design of the experiments presented in Declaration II, as compared with the design of the experiments presented in Declaration I, would have an inconsequential effect on the outcome of the comparison of data presented in said Declarations.

A. The Office Action inquires regarding the feasibility of comparing foams prepared with different oils, namely, soy and linseed oils in Declaration I and sunflower oil in Declaration II.

The oils which serve as the sources of the fatty acid methyl esters used in the comparative experiments are comprised essentially of the same 5 basic fatty acids, namely 16:0, 16:1, 18:0, 18:1, 18:2, and 18:3, wherein the number 16 or 18 refers to the number of carbon atoms in the fatty acid chain and the number 0, 1, 2, or 3 refers to the number of C=C unsaturated bonds present in the chain. Different plant sources (soy, linseed, sunflower) provide these fatty acids in different ratios, making it possible to produce a range of alcohol monomers with different diol/triol weight ratios (via hydroformylation of the mixture of unsaturated fatty acid esters to a mixture of formyl-substituted products, which are then hydrogenated to a mixture of hydroxymethylated products).

The aforementioned different plant sources provide the only convenient means to produce the alcohol monomer of the invention and the comparative monomer alcohols in the diol/triol ranges specified in the Declarations. More specifically, an alcohol monomer composition with a diol/triol ratio less than 5/1 (comparative alcohol) is readily available from linseed oil (as exemplified in the prior art and Declaration I), but not from soy oil. Soy oil simply does not have the proper ratio of di-unsaturates to tri-unsaturates to produce a diol/triol ratio less than 5/1. Linseed oil, however, has the proper ratio of di-unsaturates to tri-unsaturates and readily achieves a diol/triol ratio less than 5/1 at reasonable conversions, which were needed to obtain a comparative prior art foam. On the other hand, a diol/triol ratio above about 8/1, within the range of the claimed invention, is readily accessible from soy oil. Sunflower oil, used in Declaration II, is comprised of the same 5 basic fatty acids as soy and linseed. The sunflower examples, filed in Declaration II upon the Office's request, were taken from additional data-in-hand, rather than being produced in conjunction with the data of Declaration I. At the time the invention was made, Applicants did not know how to cover the entire range of comparative data from a diol/triol ratio of less than 5/1 (from ~3/1) upwards of 14/1 with one individual oil.

B. The Office Action inquires concerning the feasibility of comparing foams prepared with Voranol 3137A in Declaration I and Voranol 3512 in Declaration II.

VORANOL 3137A is a 3100 molecular weight (MW) product of the copolymerization of ethylene oxide (13%) and propylene oxide (87%) with glycerin, and is produced only in North America. VORANOL 3512 is a 3500 MW product of the copolymerization of ethylene oxide (12.3-13.6%) and propylene oxide (87.7-86.4%) with glycerin, and is produced in North America and Europe (where it is sold as VORANOL 3322). Both polyols are sold into the polyurethane flexible foam market. The ordinary person skilled in the art knows that these two polyols are used interchangeably and that

foam products of these two polyols are interchangeable within the qualification standards for commercial flexible foams.

C. The Office Action inquires concerning the feasibility of comparing foams prepared with different catalysts, namely, D-8264 and DC5160 in Declaration I and NIAXL-703 and NIAX A-1 in Declaration II.

The purpose of flexible foam formulation additives, such as catalysts and surfactants, is to create a combination of good foam processability (the ability to carry out a stable chemical process) and a completely cured polymer with high open cell content. A fully cured polymer results in uniform and optimal foam properties for the specific formulation employed. Open cell content is typically measured by the air flow value of the foam. Air flow values in excess of 1.5 standard cubic feet per minute (scfm), preferably in excess of 2.0 scfm, are generally acceptable values, which allow the comparison of the properties of foams of similar densities. Formulations are routinely adjusted with different combinations of catalyst(s) and different types of surfactant(s) in order to achieve this combination of fully cured polymer and high open cell content.

Although different catalysts were used in the formulations of Declaration I versus the formulations of Declaration II, the catalysts used were standard in the industry and were used in small quantities. Moreover, all of the polymer foams produced were fully cured with acceptable open cell structure. Accordingly, the catalysts used would have had little effect, if any, upon the properties of the foams produced.

D. The Office Action inquires concerning the feasibility of comparing foams prepared with different quantities of water, namely, 4.5 parts water in Declaration I and 3.0 parts water in Declaration II.

Foams that are prepared in different geographies may result in foams of different foam properties. Specifically, identical foam formulations prepared at different altitudes will result in foams with different foam densities, due to the influence of atmospheric pressure on final foam density. These effects are understood by those skilled in the art of making flexible foams; and frequently, appropriate action is taken to compensate for geographical differences.

Foam producers sell different foam grades based first on the density of the foams. A comparison of foam properties is best conducted between foams of closely similar densities. If foams of similar densities are to be compared, then formulations for foams made at sea level with a given level of water must be made with a downward-adjusted level of water when the foam is prepared at a higher altitude. The foam examples of Declaration II were prepared at a higher altitude (900 meter) as compared with the foam examples of Declaration I (sea level). Accordingly, a lower quantity of water was used in the formulations of Declaration II, as compared with the formulations of Declaration I, so

that foams of closely similar densities could be obtained; and thus, the properties of the foams could be validly compared.

The undersigned DECLARANT declares further that all statements made herein of his own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements are made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application of any patent issuing thereon.

12/16/08
Date

David A. Babb
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